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Abstract

This study reports results of a randomized, controlled trial examining the efficacy of the Family Check-Up (FCU) initiated during kindergarten on teacher report of children's emotional and behavior problems in first grade. Children's emotional and behavior needs at pretest were examined as a moderator. Participants were primary caregivers and teachers of 365 children in early elementary school. Using an intent-to-treat approach, results indicated children in the FCU condition outperformed children in a business-as-usual control condition on teacher report of emotional and behavior problems in first grade. Children experiencing higher levels of emotional and behavior problems at pretest benefited from the FCU more than did children who experienced lower levels of problems. Implications for family-centered interventions, study limitations, and future research directions are discussed.

Keywords: child behavior, family engagement, home–school collaboration

The Efficacy of the Family Check-Up on Children's Emotional and Behavior Problems in Early Elementary School

Emotional and behavior problems in childhood are among the biggest concerns facing children, their parents, and their teachers (Pastor, Rueben, & Duran, 2012). Children who exhibit behavior problems in early elementary school are at risk for developing chronic and intractable problems (Dishion & Patterson, 2006; Masten et al., 2005). Without intervention, emotional and behavior problems in childhood amplify over time and lead to serious consequences (Dodge, Greenberg, & Malone, 2008). Children who exhibit behavior problems in early elementary school are at increased risk for a variety of long-term problems, including academic difficulties, mental health problems (Valdez, Lambert, & Jalongo, 2011), substance abuse (Crum et al., 2008), employment difficulties, and violent crime (Moffitt, Caspi, Harrington, & Milne, 2002). Despite the urgent need for early assessment and intervention to address and prevent problems, many children with mental health problems are not identified by those at the front line of service delivery (e.g., teachers, pediatricians; Horwitz, Leaf, Leventhal, Forsyth, & Speechley, 1992; Levitt, Saka, Romanelli, & Hoagwood, 2007), and many children who need support do not receive effective treatment (Kataoka, Zhang, & Wells, 2002).

Kindergarten Transition

The transition to kindergarten can be a particularly challenging and pivotal time for children and families (Lee & Bierman, 2015; McIntyre, Blacher, & Baker, 2006). Children entering kindergarten are expected to possess certain skills to facilitate their success in elementary school, such as regulation of emotions and behavior (Wesley & Buysse, 2003). Findings from a national survey indicated that up to 46% of kindergarten teachers reported that half or more of students in their class demonstrated difficulties (e.g., following directions,

disorganized home environment, social skills; Rimm-Kaufman, Pianta, & Cox, 2000). However, nearly half of a national sample of school psychologists reported no involvement in kindergarten transition programming (McIntyre, Eckert, Arbolino, DiGennaro Reed, & Fiese, 2014).

Parents also experience problems during their child's transition to kindergarten. Parents have more contact with their child's teacher in early childhood settings than do parents whose child is in kindergarten (Rimm-Kaufman & Pianta, 2005). In addition, behavior problems are among the concerns most frequently reported by parents of kindergarten children (McIntyre, Eckert, Fiese, DiGennaro, & Wildenger, 2007), yet parents report minimal targeted or intensive support (McIntyre et al., 2007; Wildenger & McIntyre, 2011). However, for a variety of reasons, the importance of kindergarten is clear. Behavior problems at school entry have a deleterious impact on later conduct (Okado & Bierman, 2015). Parental expectations for their children and beliefs about their children at school entry predict later academic performance (Davis-Kean, 2005; Loughlin-Presnal & Bierman, 2017). To ameliorate difficulties children and families experience at school entry and to prevent a host of problems and promote adaptive skills, an ecological approach that supports parents and children at home, in concert with kindergarten teachers and other school staff, is essential.

Developmental Ecologies

An ecological theoretical model (Bronfenbrenner, 1977) is a useful approach to conceptualize and organize assessment and intervention for children (Dishion & Stormshak, 2007). An ecology systems approach suggests that proximal systems (e.g., home, school), more distal systems (e.g., neighborhood), connections between systems, and sociocultural factors influence child development (Bronfenbrenner, 1977). Thus, assessment and intervention for children's emotional and behavior problems must be considered within broader ecologies

(Garbacz, Herman, Thompson, & Reinke, 2017). To change the trajectory for children with emotional and behavior problems in early elementary school, developmental ecologies must be altered.

Primary ecologies for children are the home and school, as well as connections between them. The home setting and parenting practices are well established as key mechanisms through which children develop behavior problems and more adaptive skills (Dishion & McMahon, 1998; Dishion et al., 2008; Stormshak, Bierman, McMahon, Lengua, & Conduct Problems Prevention Research Group, 2000). Emotional and behavior problems are not isolated to one setting, but rather occur across settings (Achenbach, McConaughy, & Howell, 1987). Connecting home and school to provide consistent and congruent support for children is also a key mechanism to reduce behavior problems, improve parenting practices, and promote adaptive skills (Garbacz & McIntyre, 2016; Sheridan et al., 2012).

Research Support for an Ecological Approach

Early risk factors, such as poverty and adult mental health problems, can limit parents' ability to use effective parenting practices and engage with teachers to develop consistent cross-setting supports (Macmillian, McMorris, & Kruttschnitt, 2004). Thus, an ecological approach to assessment and intervention for children with emotional and behavior problems can improve parenting practices and cross-setting supports for children, parents, and teachers, which can reduce the influence of early risk factors and improve academic performance and behavior in the short term and life-course outcomes in the long term (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005; Sanders, Markie-Dadds, Tully, & Bor, 2000; Spoth et al., 2015; Stormshak, Connell, & Dishion, 2009; Stormshak et al., 2011; Van Ryzin, Stormshak, & Dishion, 2012). Such an ecological approach at school entry should provide assessment-driven and tailored,

evidence-based support for parenting in the home (Dishion & Stormshak, 2007; Stormshak & Dishion, 2002) and support for establishing and sustaining connections to enriching classroom and school environments (Bierman et al., 2008). Despite the clear benefits of an ecological approach, few interventions include parents and family–school connections (Reinke, Splett, Robeson, & Offutt, 2009).

An Ecological Approach for Assessment and Treatment in Kindergarten

The Family Check-Up (FCU) is a family-centered, school-based model for intervening in, and preventing, academic and problem behavior. The intervention is brief and consists of three components: an initial interview, an ecological assessment, and a feedback session. This ecological family intervention model emerged from a series of randomized trials to prevent a range of problem behaviors among adolescents (Dishion & Stormshak, 2007; Stormshak, Dishion, Light, & Yasui, 2005). These research trials with ethnically and socioeconomically diverse youth demonstrated intervention effects on self-regulation, grade point average, attendance, school engagement, and growth of teacher-rated child problem behavior over time (Fosco, Stormshak, Dishion, & Winter, 2012; Stormshak et al., 2005; Stormshak, Fosco, & Dishion, 2010), as well as on a variety of nonacademic outcomes, such as rates of depression, substance use, and high-risk sexual behavior (Connell, Dishion, & Deater-Deckard, 2006; Stormshak et al., 2010). Early-childhood intervention trials, starting at age 2 years, similarly have demonstrated intervention effects on self-regulation, language skills, and child behavioral problems at school entry (Dishion et al., 2008; Lunkenheimer et al., 2008), and effects improved as children received increased dosage over time (Dishion et al., 2014; Stormshak, DeGarmo, Chronister, & Caruthers, 2018). No research had examined the efficacy of the FCU at kindergarten entry as a preventative approach to reduce problem behavior and enhance the

academic success of young children during the transition to school.

Study Purpose and Research Questions

This study was conducted as part of a randomized, controlled trial that examined the FCU in early elementary school. In our study, we sought to examine the efficacy of the FCU initiated during kindergarten on teacher report of children's emotional and behavior problems in first grade. We investigated whether children with elevated emotional and behavior needs at baseline benefited from the FCU more than did children with lower levels of emotional and behavior needs at baseline. We tested the following research questions:

1. What is the efficacy of the FCU on teacher report of children's emotional and behavior problems in early elementary school? We hypothesized that the children in the FCU condition would outperform children in the business-as-usual control condition on teacher report of emotional and behavior problems in first grade (Dishion et al., 2008; Stormshak et al., 2011; Stormshak et al., 2010).
2. Do children with greater emotional and behavior needs benefit more from the FCU than do children with fewer emotional and behavior needs? We hypothesized that children with elevated emotional and behavior needs at baseline would have lower levels of teacher reported emotional and behavior problems posttest than would children without elevated emotional and behavior needs at baseline (Connell, Dishion, Yasui, & Kavanagh, 2007; Dishion et al., 2008; Stormshak et al., 2009).

Method

Participants and Setting

This study received approval from the authors' institutional review board and research compliance office. Participants were primary caregivers and teachers of 365 children in early

elementary school. All kindergarten families across five elementary schools were contacted and invited to participate at school entry. Families who consented were randomly assigned to an FCU condition or a business-as-usual control condition.

Table 1 reports demographic characteristics of participants for the total sample and for the FCU and business-as-usual control condition. Figure 1 displays allocation to condition. All primary caregivers from five schools were recruited at kindergarten entry. The average age of participating children was 5.45 ($SD = 0.50$). Primary caregivers reported that 59% of children were White. High school was reported to be the highest level of education by 25% of primary caregivers; about 13% reported having completed less than a high school degree and 24% reported having completed some college education. Primary caregivers reported that 60% of children had attended preschool.

Children's kindergarten teachers completed pretest assessments and first grade teachers completed posttest assessments. Kindergarten teachers ($N = 16$) primarily reported they were White (69%), female (100%), and completed a Master's degree (87%). First grade teachers ($N = 21$) also reported they were primarily White (95%), female (95%), and completed a Master's degree (86%). Kindergarten teachers and first grade teachers had an average of 10 ($SD = 6.60$) and 11 ($SD = 7.90$) years of teaching experience, respectively. Children attended one of five schools in an urban city and surrounding suburban areas in the Pacific Northwest region of the United States. Four of the five schools were Title I schools. Across the five schools, average student enrollment was 442 ($SD = 98.94$). Approximately 65% of students across the five schools were eligible for a free or reduced-price lunch.

Study Variables

Teachers reported about children's emotional and behavior problems by using an elementary version of the Strengths and Needs Survey (SANA; Moore et al., 2016) offered in a paper and pencil form. Kindergarten teachers completed the SANA at baseline (pretest). First grade teachers completed the SANA in fall of the following school year (posttest). The SANA is a nine-item measure rated on a 4-point scale ranging from 0 (*no concern*) to 3 (*serious concern*). Items are used to assess common areas in which students may need additional support (e.g., behaves well; pays attention, focused; sad, worried, or irritable; aggressive toward others). The SANA has evidenced reliability and validity for the unidimensional assessment (Moore et al., 2016) and demonstrated good internal consistency reliability with the present sample ($\alpha = .94$). A sum score from the SANA was included as a dependent variable in the impact analysis. In addition, the SANA sum score at pretest was examined as a moderator.

Primary caregiver report of child conduct problems was measured using the conduct problems subscale on a paper and pencil form of the Strengths and Difficulties Questionnaire (Goodman, 2001). The conduct problems subscale had acceptable internal reliability (sample $\alpha = .70$) and included five items (e.g., often lies or cheats) measured on a 3-point scale ranging from 0 (*not true*) to 2 (*certainly true*). A sum score was examined as a moderator in the impact analysis.

Family Check-Up Intervention Protocol

Training of therapists. Therapists in this study were doctoral-level psychologists who had been previously trained in the FCU through a variety of means, such as attending a training workshop and working on prior projects that used this model. Specific training content included training on the protocol, developmental norms, motivational interviewing techniques, and

academic supports for kindergarten children (Stormshak & Dishion, 2010). After training, therapists were required to observe three live FCUs (all three sessions: initial interview, ecological assessment, and feedback session) and were subsequently observed leading two FCUs. The final step before being authorized to lead the FCU independently was to have the two observed FCUs coded using the COACH rating system (Smith, Dishion, Shaw, & Wilson, 2013). Therapists' COACH ratings had to be within the satisfactory range (minimum score of 5) before they were authorized to provide the FCU independently to participants in the study. Once therapists were authorized to provide the FCU independently, weekly group supervision meetings that emphasized case conceptualization and delivery of feedback were held to maximize treatment fidelity. The second and third authors provided clinical supervision to the FCU therapists.

Intervention delivery. The FCU was delivered to families in the intervention group who agreed to participate in the intervention. The majority of families (72%) agreed to participate in the FCU and completed the feedback session. During the feedback session, families are offered a range of follow-up options, including additional sessions. Approximately one-third (35%) of families received additional sessions related to their goals, parenting skills, and academic support. Total treatment time averaged 143 minutes for families in the intervention group. The FCU model involves three steps and a menu of intervention services that are adapted and tailored to families' needs. It follows a tiered service delivery model as described by Dishion and Stormshak (2007).

A multitiered model has been applied in many school-based programs (Walker et al., 1996), including School-Wide Positive Behavior Support (SWPBS; Sugai & Horner, 2002) and First Step to Success (Walker et al., 2009). Consistent with a multitiered model (e.g., Fuchs &

Fuchs, 2006), intervention services are modified to fit the needs of families on the basis of assessment and risk status. In this study, all intervention families were offered basic support in the form of brochures, educational materials, and information about the transition to kindergarten. Those who engaged in the FCU received an initial interview and ecological assessment during a single visit (selected intervention). This was followed by a feedback session with goal planning and was typically delivered in the family home. Feedback focused on the targeted intervention areas for kindergarten children during the school transition and included information about early learning, parenting skills, contextual stressors, home-to-school planning, and family strengths. Home-to-school planning primarily included supporting caregivers, but in some instances also included working directly with teachers to facilitate home-school success when that was consistent with a family's goal. Follow-up sessions were guided by parents' goal setting, were collaborative, and provided additional, brief support focused on targeted goals (indicated support). Common themes addressed during these sessions included behavioral routines in the home, positive parenting, and home-to-school planning for academic success (Dishion, Stormshak, & Kavanagh, 2011).

Business-as-Usual Condition

Participants in the business-as-usual condition received traditional support from schools (e.g., behavior intervention plans) and support outside of school (e.g., mental health support). There were no significant differences between the FCU and business-as-usual conditions on the proportion of children who received special services in school, [$\chi^2 (1) = 0.308, p > 0.05$] or the proportion of children who received mental health services, [$\chi^2 (1) = 1.536, p > 0.05$] at pretest. This pattern also held at posttest for special services in school, [$\chi^2 (1) = 1.537, p > 0.05$] and mental health services, [$\chi^2 (1) = 0.851, p > 0.05$].

Statistical Analysis

Our first research question assessed effects of the FCU on teacher reported concerns by using an analysis of repeated measures nested within students, the level of assignment to study condition. The analysis accounts for autocorrelation among assessments within individual students and tests for differences between conditions on change in outcome from pretest to posttest. The model included condition, time, and the condition \times time interaction, with condition coded 0 for control and 1 for treatment and time coded 0 at pretest and 1 at posttest. Hedges' g effect sizes (Hedges, 1981) for the condition \times time effect are reported to ease interpretation of results (0.2, 0.5, and 0.8 correspond to small, medium, and large effects, respectively).

For our second research question, we examined whether primary caregiver reported conduct problems at pretest, or teacher reported emotional and behavior problems at pretest, separately moderated the treatment effect. The repeated-measures analysis was extended to include a moderator and its interaction with condition, time, and the condition \times time term, resulting in a three-way interaction, all corresponding two-way interactions, and individual effects. The three-way interaction between the moderator, condition, and time provides evidence of moderation.

We fit models to our data with SAS PROC MIXED version 9.4 (SAS Institute, 2016) using restricted maximum likelihood estimation and between-within degrees of freedom approximation (Schluchter & Elashoff, 1990). The efficacy analysis included $N = 340$ students (FCU $n = 175$; control $n = 165$; see Figure 1) with either pretest or posttest outcome scores. We ignored higher levels of nesting (e.g., classroom, school) because randomization and intervention delivery occurred at the student-level. Higher levels of nesting have no effect on the average

effect estimator or its standard error for this study design (Raudenbush & Sadoff, 2008), and consequently no effect on the Type I or Type II error rates.

Maximum likelihood estimation uses all available data and produces potentially unbiased results even in the face of substantial missing data, provided the missing data were missing at random (Schafer & Graham, 2002). We considered this assumption tenable, meaning that missing data likely did not depend on unobserved determinants of the outcome (Little & Rubin, 2002). The statistical models also assume independent and normally distributed observations. We addressed the first assumption by modeling correlated repeated measures. The outcome measure in our study also did not markedly deviate from normality; skewness and kurtosis fell within ± 2.0 .

Results

Descriptive Results, Baseline Equivalence, and Attrition

Table 2 reports descriptive statistics and correlations among study variables. A large correlation coefficient was observed between pretest and posttest teacher report of children's emotional and behavior problems. A medium correlation coefficient was observed between pretest and posttest teacher report of emotional and behavior problems and pretest primary caregiver report of conduct problems. Small negative correlations were observed between pretest and posttest teacher report of emotional and behavior problems and primary caregiver report of education. FCU and control groups did not significantly differ on levels of teacher reported concern at pretest ($p = .102$).

To evaluate the extent to which attrition threatened the internal validity of this study, we used regression analysis designed to test whether the outcome variable was differentially affected across conditions by attrition. These analyses examined the effects of condition, attrition status,

and their interaction on the pretest outcome. Examination of attrition between pretest and posttest revealed 149 (78%) of the treatment participants and 140 (80%) of the control participants completed a posttest assessment. We found no statistically significant interaction between attrition and condition predicting baseline outcome ($p = .792$), suggesting that the effect of attrition on outcomes did not vary by condition.

Efficacy Results

We tested the hypothesis that participants in the FCU condition would experience greater decreases in teacher report of children's emotional and behavior problems than would participants in the control condition. The model summarized in Table 3 tested fixed effects for differences between conditions at pretest (condition effect), gains across time, and the interaction between the two. Children in the FCU condition experienced greater decreases in teacher reported emotional and behavior problems than did children in the control condition ($t = -2.51$, $df = 191$, $p = .013$). The model estimated differences in gains between the FCU and control conditions of -1.71 (Hedges' $g = -0.28$). Figure 2 depicts model-based estimates of pretest and posttest teacher report of children's emotional and behavior problems.

Moderation Results

Analyses revealed a significant three-way interaction between condition, time, and baseline teacher reported emotional and behavioral problems indicating children with greater emotional and behavior problems experienced greater benefit from the intervention than did children with lower levels of emotional and behavior problems ($t = -2.13$, $df = 189$, $p = .035$). Estimated differences between treatment and control conditions in pretest to posttest change in the outcome were -0.80 for children at the 25th percentile in teacher reported emotional and behavior problems at baseline ($p = .250$), -1.34 for children at the 50th percentile at baseline (p

= .021), and -2.41 for children at the 75th percentile at baseline ($p < .001$). Subgroup analyses based on children at or above the 50th percentile on teacher reported emotional and behavior problems at baseline generated an effect size of $g = -0.43$ ($p = .035$). We observed no evidence of moderation by caregiver report of conduct problems ($p = .156$).

Discussion

The purpose of our study was to examine the efficacy of the FCU initiated during kindergarten relevant to teacher report of children's emotional and behavior problems in first grade. We also investigated whether children with elevated emotional and behavior needs at pretest benefited more from the FCU than did children with lower levels of emotional and behavior needs at pretest. This study targeted children's emotional and behavior problems, one of the biggest concerns facing children, parents, and teachers (Pastor et al., 2012). By targeting families of children at kindergarten entry, children and families can receive effective treatment before problems amplify or become chronic (Dodge et al., 2008). This research supports the efficacy of the FCU at kindergarten entry for reducing risk factors associated with the long-term development of academic and behavior problems.

Study results suggest that children randomly assigned to the FCU experienced greater decreases in emotional and behavior problems than did controls. Results were obtained by using an intent-to-treat approach to analyses, which is known to be the most stringent approach to testing results of randomized trials (Lachin, 2000). Second, students experiencing higher levels of emotional and behavior problems at kindergarten entry benefited most from the intervention in comparison with students who were experiencing lower levels of emotional and behavior problems. These results are consistent with FCU effects during middle school (Stormshak et al., 2009) and suggest that family-centered approaches, such as the FCU, have great promise for

reducing child risk and promoting positive outcomes at kindergarten entry. This study adds substantially to research that has examined the FCU in early childhood (Dishion et al., 2008) and in middle school (Stormshak et al., 2011) by targeting kindergarten entry.

Of note is that our primary outcome measure was teacher reports of children's emotional and behavior problems. We worked directly with some teachers on home-to-school planning with families, but only when it was a goal for families and done in a limited manner. As a result, not all teachers were aware of which children were in the intervention versus control group or how much intervention had been received, making these reports less susceptible to bias and social desirability that are sometimes present in randomized trials (Jadad et al., 1996).

Implications

Although social, emotional, and behavioral skills have been identified as important kindergarten survival skills (Welchons & McIntyre, 2017) and have been targeted in a range of school interventions (e.g., Nix et al., 2016), few interventions are designed to work directly with families on these important child skills. Moreover, the family interventions that demonstrate significant effects on child behavior, such as behavioral parent training programs, are costly and challenging to implement. The FCU overcomes many of the traditional barriers by delivering interventions that are based on family needs, are tailored to fit family priorities, and are delivered in a manner that capitalizes on family strengths and motivation to change (Dishion & Stormshak, 2007). Beyond behavioral parent training interventions, some interventions have focused on improving academic and social-emotional readiness skills in young children and emphasizing home-to-school planning (e.g., Berlin, Dunning, & Dodge, 2011). These studies, however, have limited focus on parenting skills and support for families during kindergarten transition.

The importance of using an ecological approach to conceptualizing and organizing assessment and intervention for children is well established (Bronfenbrenner, 1977; Stormshak & Dishion, 2002). The FCU is family centered, which distinguishes it from other ecological approaches in early elementary school, such as family–school partnership interventions (Sheridan et al., 2012). In a family-centered approach, families are respected, supported, and empowered to make decisions and use parenting and home–school collaboration strategies that are best for their family (Dunst, Trivette, & Hamby, 2007). The focus on family centeredness within a broader ecological approach targets and mobilizes resources for families and the home environment in ways that may be more likely to sustain over time, relative to approaches that do not have an explicit focus on family support and the home environment (Dunst et al., 2007; Spoth et al., 2015; Stormshak et al., 2010)

In addition to family centeredness, an important aspect of the FCU is its integration of a multitiered framework. This design organizes assessment and intervention through a scope and sequence that provides tailored support (Dishion & Stormshak, 2007; Stormshak & Dishion, 2002). The combined family-centered approach embedded in a broader ecological perspective and the overall multitiered framework can maximize organizational efficiencies (Garbacz et al., 2016) and facilitate parent engagement (Stormshak et al., 2005). Two primary barriers to family engagement commonly reported by school staff are a lack of resources and the challenge of facilitating parents' participation in activities and intervention (Garbacz et al., in press). The FCU specifically focuses on efficiency in the multitiered framework (Dishion & Stormshak, 2007; Horner & Sugai, 2015) and uses approaches such as motivational interviewing to promote engagement (Stormshak & Dishion, 2002).

Findings from our study suggest that an average of 137 minutes of intervention produced significant changes in teacher reported student emotional and behavior outcomes. The effect size for teacher report of emotional and behavior problems is comparable to effect sizes for parent-mediated interventions (Maughan et al., 2005). Schools must make choices about services they provide (Belfield & Levin, 2007). When implemented in middle school, the FCU produces intervention effects into high school (Stormshak et al., 2009; Van Ryzin et al., 2012), which suggests the robustness of the FCU and a family-centered approach. Findings from our study in the context of other research on the FCU position the FCU as an efficient approach that aligns with existing school frameworks (Sugai & Horner, 2002). Findings also suggest that when schools use the FCU (Irvine, Biglan, Smolkowski, Metzler, & Ary, 1999; Smolkowski et al., 2017), there is good potential for substantial return as they invest in this ecological, family-centered approach at kindergarten entry (Crowley, Jones, Greenberg, Feinberg, & Spoth, 2012).

Limitations and Future Research Directions

Although our study fills a gap in current intervention programming for children entering kindergarten, this study is not without limitations. First, our sample is limited to students in five urban elementary schools from primarily lower income backgrounds. Second, our intervention was flexible and based on family need and priorities. Thus, the specific targets of intervention and dosage of intervention varied depending on parents' willingness to engage in follow-up services following the feedback session. Third, this study focused on teacher reports of student behavioral and emotional functioning in school settings. Although teachers were not completely blind to intervention condition, teachers were not targets of our intervention.

Findings from this study in the context of these limitations suggest important directions for future research. Because of the location and characteristics of elementary schools, future

research should investigate the FCU in different geographic areas, such as rural communities where an efficient and family-centered approach is needed (DeLeon, Wakefield, & Hagglund, 2003; Johnson, Showalter, Klein, & Lester, 2014; Semke & Sheridan, 2012). In addition, FCU effects in early elementary school on other outcomes, such as those home behavior and parenting strategies, should be investigated. Having examined the moderation of pretest emotional and behavior problems, this study has begun to address for whom the FCU may be most effective when it is implemented at kindergarten entry. Future research should examine mechanisms for intervention effects. For example, evidence-based parenting practices in the home may strengthen or explain effects of the FCU on children's emotional, behavior, or social problems (Fosco et al., 2012).

Conclusion

This study fills a substantial gap in kindergarten transition intervention programming by demonstrating that a brief intervention focused on parenting can contribute to significantly improved emotional and behavioral outcomes in students. The randomized, controlled trial; sample size; and ITT analytic strategy all contribute to the multiple methodological strengths. Notably, students with the greatest need improved the most, suggesting that the FCU can be used across various risk groups. Previous studies demonstrating the efficacy of the FCU suggest that families in greatest need choose to receive more follow-up services (Connell et al., 2007; Dishion et al., 2008; Stormshak et al., 2009). In conclusion, study results demonstrate promising new directions for interventions intended to facilitate kindergarten transition and improve student emotional and behavioral outcomes.

References

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*, 213–232. doi: 10.1037/0033-2909.101.2.213
- Belfield, C. R., & Levin, H. M. (2007). *The price we pay: Economic and social consequences of inadequate education*. Washington, D.C: Brookings Institution Press.
- Berlin, L. J., Dunning, R. D., & Dodge, K. A. (2011). Enhancing the transition to kindergarten: A randomized trial to test the efficacy of the “Stars” summer kindergarten orientation program. *Early Childhood Research Quarterly*, *26*, 247–254. doi: 10.1016/j.ecresq.2010.07.004
- Bierman, K. L., Domitrovich, C. E., Nix, R. L., Gest, S. D., Welsh, J. A., Greenberg, M. T., ... Sukhdeep, G. (2008). Promoting academic and social-emotional school readiness: The head start REDI program. *Child Development*, *79*, 1802–1817. doi: 10.1111/j.1467-8624.2008.01227.x
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*, 513–530. doi: 10.1037/0003-066X.32.7.513
- Connell, A. M., Dishion, T. J., & Deater-Deckard, K. (2006). Variable- and person-centered approaches to the analysis of early adolescent substance use: Linking peer, family, and intervention effects. *Merrill-Palmer Quarterly*, *52*, 421–448. doi: 10.1353/mpq.2006.0025
- Connell, A. M., Dishion, T. J., Yasui, M., & Kavanagh, K. (2007). An adaptive approach to family intervention: Linking engagement in family-centered intervention to reductions in

- adolescent problem behavior. *Journal of Consulting and Clinical Psychology*, *75*, 568–579. doi: 10.1037/0022-006X.75.4.568
- Crowley, D. M., Jones, D. E., Greenberg, M. T., Feinberg, M. E., & Spoth, R. (2012). Resource consumption of a diffusion model for prevention programs: The PROSPER delivery system. *Journal of Adolescent Health*, *50*, 256–263. doi: 10.1016/j.jadohealth.2011.07.001
- Crum, R. M., Storr, C. L., Ialongo, N., & Anthony, J. C. (2008). Is depressed mood in childhood associated with an increased risk for initiation of alcohol use during early adolescence? *Addictive Behaviors*, *33*(1), 24–40.
- Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology*, *19*, 294–304. doi: 10.1037/0893-3200.19.2.294
- DeLeon, P. H., Wakefield, M., & Hagglund, K. J. (2003). *The behavioral health care needs of rural communities*. Washington, DC: American Psychological Association.
- Dishion, T. J., Brennan, L. M., Shaw, D. S., McEachern, A. D., Wilson, M. N., & Booil, J. (2014). Prevention of problem behavior through annual Family Check-Ups in early childhood: Intervention effects from home to early elementary school. *Journal of Abnormal Child Psychology*, *42*, 343–354. doi: 10.1007/s10802-013-9768-2
- Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, *1*, 61–75. doi: 10.1023/A:1021800432380
- Dishion, T. J., & Patterson, G. R. (2006). The development and ecology of antisocial behavior in children and adolescents. In D. Cicchetti & D. Cohen (Eds.), *Developmental*

- psychopathology, Vol 3: Risk, disorder, and adaptation* (2nd ed., pp. 503–541). Hoboken, NJ: John Wiley & Sons, Inc.
- Dishion, T. J., Shaw, D., Connell, A., Gardner, F., Weaver, C., & Wilson, M. (2008). The Family Check-Up with high-risk indigent families: Preventing problem behavior by increasing parents' positive behavior support in early childhood. *Child Development, 79*, 1395–1414. doi: 10.1111/j.1467-8624.2008.01195.x
- Dishion, T. J., & Stormshak, E. A. (2007). *Intervening in children's lives: An ecological, family-centered approach to mental health care*. Washington, DC: American Psychological Association.
- Dishion, T. J., Stormshak, E. A., & Kavanagh, K. (2011). *Everyday parenting: A professional's guide to building family management*. Champaign, IL: Research Press.
- Dodge, K. A., Greenberg, M. T., & Malone, P. S. (2008). Testing an idealized dynamic cascade model of the development of serious violence in adolescence. *Child Development, 79*, 1907–1927. doi: 10.1111/j.1467-8624.2008.01233.x
- Dunst, C. J. (1995). *Key characteristics and features of community-based family support programs*. Chicago, IL: Family Resource Coalition.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2007). Meta-analysis of family-centered helping practices research. *Mental Retardation and Developmental Disabilities, 13*, 370–378. doi: 10.1002/mrdd.20176
- Fosco, G. M., Stormshak, E. A., Dishion, T. J., & Winter, C. E. (2012). Family relationships and parental monitoring during middle school as predictors of early adolescent problem behavior. *Journal of Clinical Child & Adolescent Psychology, 41*, 202–213. doi: 10.1080/15374416.2012.651989

- Fuchs, L. S., & Fuchs, D. (2006). A framework for building capacity for responsiveness to intervention. *School Psychology Review, 35*(4), 621–626.
- Garbacz, S. A., Herman, K. C., Thompson, A. M., & Reinke, W. M. (2017). Family engagement in education and intervention: Implementation and evaluation to maximize family, school, and student outcomes. *Journal of School Psychology, 62*, 1–10. doi: 10.1016/j.jsp.2017.04.002
- Garbacz, S. A., Hirano, K. A., McIntosh, K., Eagle, J. W., Minch, D., & Vatland, C. (in press). Family engagement in schoolwide positive behavioral interventions and supports: Current practices, barriers, and opportunities. *School Psychology Quarterly*.
- Garbacz, S. A., McIntosh, K., Eagle, J. W., Dowd-Eagle, S. E., Ruppert, T., & Hirano, K. (2016). Family engagement within school-wide positive behavioral interventions and supports. *Preventing School Failure: Alternative Education for Children and Youth, 60*, 60–69. doi: 10.1080/1045988X.2014.976809
- Garbacz, S.A., & McIntyre, L. L. (2016). Conjoint behavioral consultation for children with autism spectrum disorder. *School Psychology Quarterly, 31*, 450–466. doi: 10.1037/spq0000114
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 1337–1345. doi: 10.1016/j.psychres.2012.09.019
- Hedges, L. V. (1981). Distribution theory for Glass's estimator of effect size and related estimators. *Journal of Educational Statistics, 6*(2), 107–128. doi: 10.2307/1164588

- Horner, R. H., & Sugai, G. (2015). School-wide PBIS: An example of applied behavior analysis implemented at a scale of social importance. *Behavior Analysis in Practice*, *8*, 80–85. doi: 10.1007/s40617-015-0045-4
- Horwitz, S. M., Leaf, P. J., Leventhal, J. M., Forsyth, B., & Speechley, K. N. (1992). Identification and management of psychosocial and developmental problems in community-based, primary care pediatric practices. *Pediatrics*, *89*, 480–485. doi: 10.1177/000992280404300407
- Irvine, A. B., Biglan, A., Smolkowski, K., Metzler, C. W., & Ary, D. V. (1999). The effectiveness of a parenting skills program for the parents of middle school students in small communities. *Journal of Consulting and Clinical Psychology*, *67*, 811–825. doi: 10.1037/0022-006X.67.6.811
- Jadad, A. R., Moore, R. A., Carroll, D., Jenkinson, C., Reynolds, J. M., Gavaghan, D. J., & McQuay, H. J. (1996). Assessing the quality of reports of randomized clinical trials: Is blinding necessary? *Controlled Clinical Trials*, *17*, 1–12. doi: 10.1016/0197-2456(95)00134-4
- Johnson, J., Showalter, D., Klein, R., & Lester, C. (2014). *Why rural matters 2013-2014: The condition of rural education in the 50 states*. Arlington, VA: Rural School and Community Trust.
- Kataoko, S. H., Zhang, L., & Wells, K. B. (2002). Unmet need for mental health care among U.S. children: Variation by ethnicity and insurance status. *The American Journal of Psychiatry*, *159*, 1548–1555. doi: 10.1176/appi.ajp.159.9.1548
- Lachin, J. M. (2000). Statistical considerations in the intent-to-treat principle. *Controlled Clinical Trials*, *21*, 167–189. doi: 10.1016/S0197-2456(00)00046-5

- Lee, P. & Bierman, K. L. (2015). Classroom and teacher support in kindergarten: Associations with the behavioral and academic adjustment of low-income students. *Merrill-Palmer Quarterly*, *61*, 383–411. doi: 10.13110/merrpalmquar1982.61.3.0383
- Levitt, J. M., Saka, N., Romanelli, L. H., & Hoagwood, K. (2007). Early identification of mental health problems in schools: The status of instrumentation. *Journal of School Psychology*, *45*, 163–191. doi: 10.1016/j.jsp.2006.11.005
- Little, R. J. A. & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). New York, NY: John Wiley & Sons.
- Loughlin-Presnal, J. E., & Bierman, K. L. (2017). Promoting parent academic expectations predicts improved school outcomes for low-income children entering kindergarten. *Journal of School Psychology*, *62*, 67–80. doi: 10.1016/j.jsp.2017.03.007
- Lunkenheimer, E. S., Dishion, T. J., Shaw, D. S., Connell, A. M., Gardner, F. E. M., Wilson, M. N., & Skuban, E. M. (2008). Collateral benefits of the Family Check-Up on early childhood school readiness: Indirect effects of parents' positive behavior support. *Developmental Psychology*, *44*, 1737–1752. doi: 10.1037/a0013858
- Macmillan, R., McMorris, B. J., & Kruttschnitt, C. (2004). Linked lives: Stability and change in maternal circumstances and trajectories of antisocial behavior in children. *Child Development*, *75*, 205–220. doi: 10.1111/j.1467-8624.2004.00664.x
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., ... Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, *41*, 733–746. doi: 10.1037/0012-1649.41.5.733

- Maughan, D. R., Christiansen, E., Jenson, W. R., Olympia, D., & Clark, E. (2005). Behavioral parent training as a treatment for externalizing behaviors and disruptive behavior disorders: A meta-analysis. *School Psychology Review, 34*, 267–286.
- McIntyre, L. L., Blacher, J., & Baker, B. L. (2006). The transition to school: Adaptation in young children with and without intellectual disability. *Journal of Intellectual Disability Research, 50*, 349–361. doi: 10.1111/j.1365-2788.2006.00783.x
- McIntyre, L. L., Eckert, T. L., Arbolino, L. A., DiGennaro Reed, F. D., & Fiese, B. H. (2014). The transition to kindergarten for typically developing children: A survey of school psychologists' involvement. *Early Childhood Education Journal, 42*, 203–210. doi: 10.1007/s10643-013-0593-6
- McIntyre, L. L., Eckert, T. L., Fiese, B. H., DiGennaro, F. D., & Wildenger, L. K. (2007). The transition to kindergarten: Family experiences and involvement. *Early Childhood Education Journal, 35*(1), 83–88. doi: 10.1007/s10643-007-0175-6
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on life-course-persistent and adolescent-limited antisocial pathways: Follow-up at age 26 years. *Developmental Psychopathology, 14*, 179–207. doi: 10.1017/S0954579402001104
- Moore, K. J., Garbacz, S. A., Gau, J. M., Dishion, T. J., Brown, K. L., Stormshak, E. A., & Seeley, J. R. (2016). Proactive parent engagement in public schools: Using a brief strengths and needs assessment in a multiple-gating risk management strategy. *Journal of Positive Behavior Interventions, 18*(4), 230–240. doi: 10.1177/1098300716632590
- Nix, R. L., Bierman, K. L., Heinrichs, B. S., Gest, S. D., Welsh, J. A., & Domitrovich, C. E. (2016). The randomized controlled trial of Head Start REDI: Sustained effects on

- developmental trajectories of social–emotional functioning. *Journal of Consulting and Clinical Psychology, 84*(4), 310–322. doi: 10.1037/a0039937
- Okado, Y., & Bierman, K. L. (2015). Differential risk for late adolescent conduct problems and mood dysregulation among children with early externalizing behavior problems. *Journal of Abnormal Psychology, 43*, 735–747. doi: 10.1007/s10802-014-9931-4
- Pastor, P. N., Reuben, C. A., & Duran, C. R. (2012). Identifying emotional and behavioral problems in children aged 4–17 years: United States, 2001–2007. *National Health Statistics Reports, 48*, 1–17.
- Raudenbush, S. W., & Sadoff, S. (2008). Statistical inference when classroom quality is measured with error. *Journal of Research on Educational Effectiveness, 1*(2), 138-154.
- Reinke, W. M., Splett, J. D., Robeson, E. N., & Offutt, C. A. (2009). Combining school and family interventions for the prevention and early intervention of disruptive behavior problems in children: A public health perspective. *Psychology in the Schools, 46*, 33–43. doi: 10.1002/pits.20352
- Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology, 21*, 491–511. doi: 10.1016/S0193-3973(00)00051-4
- Rimm-Kaufman, S. E., & Pianta, R. C. (2005). Family-school communication in preschool and kindergarten in the context of a relationship-enhancing intervention. *Early Education and Development, 16*, 287–316. doi: 10.1207/s15566935eed1603_1
- Rimm-Kaufman, S. E., Pianta, R. C., & Cox, M. J. (2000). Teachers' judgments of problems in the transition to kindergarten. *Early Childhood Research Quarterly, 15*, 147–166. doi: 10.1016/S0885-2006(00)00049-1

- Sanders, M. R., Markie-Dadds, C. Tully, L., & Bor, B. (2000). The triple P-positive parenting program: A comparison of enhanced, standard, and self-directed behavioral family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology, 68*, 624–640. doi: 10.1037/0022-006X.68.4.624
- SAS Institute. (2016). SAS/STAT® 14.2 user's guide. Cary, NC: SAS Institute, Inc. Retrieved from the SAS Product Documentation web site: <http://support.sas.com/documentation/index.html>
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147–177. doi: 10.1037/1082-989X.7.2.147
- Schluchter, M. D., & Elashoff, J. D. (1990). Small-sample adjustments to tests with unbalanced repeated measures assuming several covariance structures. *Journal of Statistical Computation and Simulation, 37*, 69–87. doi: 10.1080/00949659008811295
- Semke, C. A., & Sheridan, S. M. (2012). Family-school connections in rural educational settings: A systematic review of the empirical literature. *School Community Journal, 22*, 21–48.
- Sheridan, S. M., Bovaird, J. A., Glover, T. A., Garbacz, S. A., Witte, A., & Kwon, K. (2012). A randomized trial examining the effects of conjoint behavioral consultation and the mediating role of the parent–teacher relationship. *School Psychology Review, 41*, 23–46.
- Smith, J. D., Dishion, T. J., Shaw, D. S., & Wilson, M. N. (2013). Indirect effects of fidelity to the Family Check-Up on changes in parenting and early childhood problem behaviors. *Journal of Clinical and Consulting Psychology, 81*, 962–974. doi: 10.1037/a0033950
- Smolkowski, K., Seeley, J. R., Gau, J. M., Dishion, T. J., Stormshak, E. A., Moore, K. J., . . . Garbacz, S. A. (2017). Effectiveness evaluation of the positive family support

- intervention: A three-tiered public health delivery model for middle schools. *Journal of School Psychology, 61*, 103–125. doi: 10.1016/j.jsp.2017.03.004
- Spoth, R. L., Trudeau, L. S., Redmond, C. R., Shin, C., Greenberg, M. T., Feinberg, M. E., & Hyun, G-H. (2015). PROSPER partnership delivery system: Effects on adolescent conduct problem behavior outcomes through 6.5 years past baseline. *Journal of Adolescence, 45*, 44–55. doi: 10.1016/j.adolescence.2015.08.008
- Stormshak, E. A., Bierman, K. L., McMahon, R. J., Lengua, L. J., & Conduct Problems Prevention Research Group. (2000). Parenting practices and child disruptive behavior problems in early elementary school. *Journal of Clinical Child Psychology, 29*, 17–29. doi: 10.1207/S15374424jccp2901_3
- Stormshak, E. A., Connell, A. M., & Dishion, T. J. (2009). An adaptive approach to family-centered intervention in schools: Linking intervention engagement to academic outcomes in middle and high school. *Prevention Science, 10*, 221–235. doi: 10.1007/s11121-009-0131-3
- Stormshak, E. A., Connell, A. M., Véronneau, M. H., Myers, M. W., Dishion, T. J., Kavanagh, K., & Caruthers, A. S. (2011). An ecological approach to promoting early adolescent mental health and social adaptation: Family-centered intervention in public middle schools. *Child Development, 82*, 209–225. doi: 10.1111/j.1467-8624.2010.01551.x
- Stormshak, E. A., DeGarmo, D. D., Chronister, K. M., & Caruthers, A. (2018). The impact of family-centered prevention on self-regulation and subsequent long-term risk in emerging adults. *Prevention Science, 19*, 549–558.
- Stormshak, E. A., & Dishion, T. J. (2002). An ecological approach to child and family clinical and counseling psychology. *Clinical Child and Family Psychology Review, 5*, 197–215. doi: 10.1023/A:1019647131949

Stormshak, E. A., & Dishion, T. J. (2010). *The Family Check-Up training website*.

<http://fcu.cfc.uoregon.edu>

Stormshak, E. A., Dishion, T. J., Light, J., & Yasui, M. (2005). Implementing family-centered interventions within the public middle school: Linking service delivery to change in student problem behavior. *Journal of Abnormal Child Psychology*, *33*, 723–733. doi: 10.1007/s10802-005-7650-6

Stormshak, E. A., Fosco, G. M., & Dishion, T. J. (2010). Implementing interventions with families in schools to increase youth school engagement: The Family Check-Up model. *School Mental Health*, *2*, 82–92. doi: 10.1007/s12310-009-9025-6

Sugai, G., & Horner, R. H. (2002). The evolution of discipline practices: School-wide positive behavior supports. *Child and Family Behavior Therapy*, *24*, 23–50. doi: 10.1300/J019v24n01_03

Valdez, C. R., Lambert, S. F., & Ialongo, N. S. (2011). Identifying patterns of early risk for mental health and academic problems in adolescence: A longitudinal study of urban youth. *Child Psychiatry and Human Development*, *42*, 521–538. doi: 10.1007/s10578-011-0230-9

Van Ryzin, M. J., Stormshak, E. A., & Dishion, T. J. (2012). Engaging parents in the Family Check-Up in middle school: longitudinal effects on family conflict and problem behavior through the high school transition. *Journal of Adolescent Health*, *50*, 627–633. doi: 10.1016/j.jadohealth.2011.10.255

Walker, H. M., Horner, R. H., Sugai, G., Bullis, M., Sprague, J. R., Bricker, D., & Kaufman, M. J. (1996). Integrated approaches to preventing antisocial behavior patterns among school-

- age children and youth. *Journal of Emotional and Behavioral Disorders*, 4, 194–209. doi: 10.1177/106342669600400401
- Walker, H. M., Seeley, J. R., Small, J., Severson, H. H., Graham, B. A., Feil, E. G., ... Forness, S. R. (2009). A randomized controlled trial of the First Step to Success early intervention: Demonstration of program efficacy outcomes in a diverse, urban school district. *Journal of Emotional and Behavioral Disorders*, 17(4), 197–212. doi: 10.1177/1063426609341645
- Welchons, L. K. W., & McIntyre, L. L. (2017). The transition to kindergarten: Predicting socio-behavioral outcomes for children with and without disabilities. *Early Childhood Education Journal*, 45(1), 83–93. doi: 10.1007/s10643-015-0757-7
- Wesley, P. W., & Buysse, V. (2003). Making meaning of school readiness in schools and communities. *Early Childhood Research Quarterly*, 3, 351–375. doi: 10.1016/S0885-2006(03)00044-9
- Wildenger, L. K., & McIntyre, L. L. (2011). Family concerns and involvement during kindergarten transition. *Journal of Child and Family Studies*, 20, 387–396. doi: 10.1007/s10826-010-9403-6
- Wildenger, L. K., & McIntyre, L. L. (2012). Investigating the relation between kindergarten preparation and child socio-behavioral school outcomes. *Early Childhood Education Journal*, 40(3), 169–176. doi: 10.1007/s10643-012-0509-x

Table 1

Demographic Characteristics of Caregivers and Children

	% Total (<i>N</i> = 365)	% FCU (<i>n</i> = 190)	% Control (<i>n</i> = 175)
Primary caregiver mean (<i>SD</i>) age	33.89 (6.33)	33.88 (5.83)	33.89 (5.83)
Primary caregiver gender			
Female	89.4	89	89.8
Male	10.6	11	10.2
Primary caregiver highest level of education			
Less than high school	13.4	10.5	16.5
High school	25.3	24.5	26.1
Partial college	24.4	26.4	22.3
Junior college or associate's degree	10.6	12.9	8.3
4-year college degree	17.5	20.2	14.6
Graduate professional training	8.8	5.5	12.1
Children's mean (<i>SD</i>) age	5.45 (0.50)	5.52 (0.50)	5.38 (0.49)
Children's gender			
Female	45.2	44.7	45.7
Male	54.8	55.3	54.3
Children's race/ethnicity			
White	58.6	59.1	58
Multiple races/ethnicities	22.1	20.7	23.6
Hispanic/Latino	13.4	13.4	13.4
Asian	2.2	1.8	2.5
Black/African American	1.9	2.4	1.3
Unknown	1.6	2.4	0.6
Pacific Islander	0.3	0	0.6
Children who attended preschool	60.3	52.6	68.6

Note. FCU = Family Check-Up.

Table 2

Descriptive Statistics and Correlations Among the Variables

	1	2	3	4	5
1. Condition ¹	–				
2. Pretest teacher reported emotional and behavior	.06	–			
3. Posttest teacher reported emotional and behavior	.06	.78**	–		
4. Pretest primary caregiver reported conduct problems	.03	.45**	.41*	–	
5. Primary caregiver education ²	.03	-.16*	-.21*	-.10	–
<i>M</i>	.51	5.60	5.39	1.62	6.07
<i>SD</i>	.50	6.80	6.31	1.74	1.76

¹ Condition was coded 0 = control, 1 = FCU. ² 1 = no formal schooling, 2 = 7th grade or less, 3 = junior high completed, 4 = partial high school completed, 5 = high school graduate, 6 = partial college, 7 = junior college or associate's degree, 8 = 4-year college graduate, 9 = graduate professional training.

* $p < .05$. ** $p < .01$.

Table 3

Results of a Time × Condition Analyses of Pretest to Posttest Change in Teacher Report of Emotional and Behavior Problems

Fixed effects	Intercept	5.01*** (0.56)
	Condition	0.45 (0.49)
	Time	1.28 (0.78)
	Condition × Time	-1.71* (0.68)
Variances	Subject	30.98*** (3.23)
	Residual	12.41*** (1.29)
Hedges' <i>g</i>	Time × Condition	-0.276
<i>p</i> -values	Time × Condition	.013

Note. Condition coded 0 for control and 1 for treatment. Table entries show parameter estimates with standard errors in parentheses except for Hedges' *g* values, *p*-values. Tests of fixed effects used 191 degrees of freedom.

p* < .05. *p* < .01. ****p* < .001.

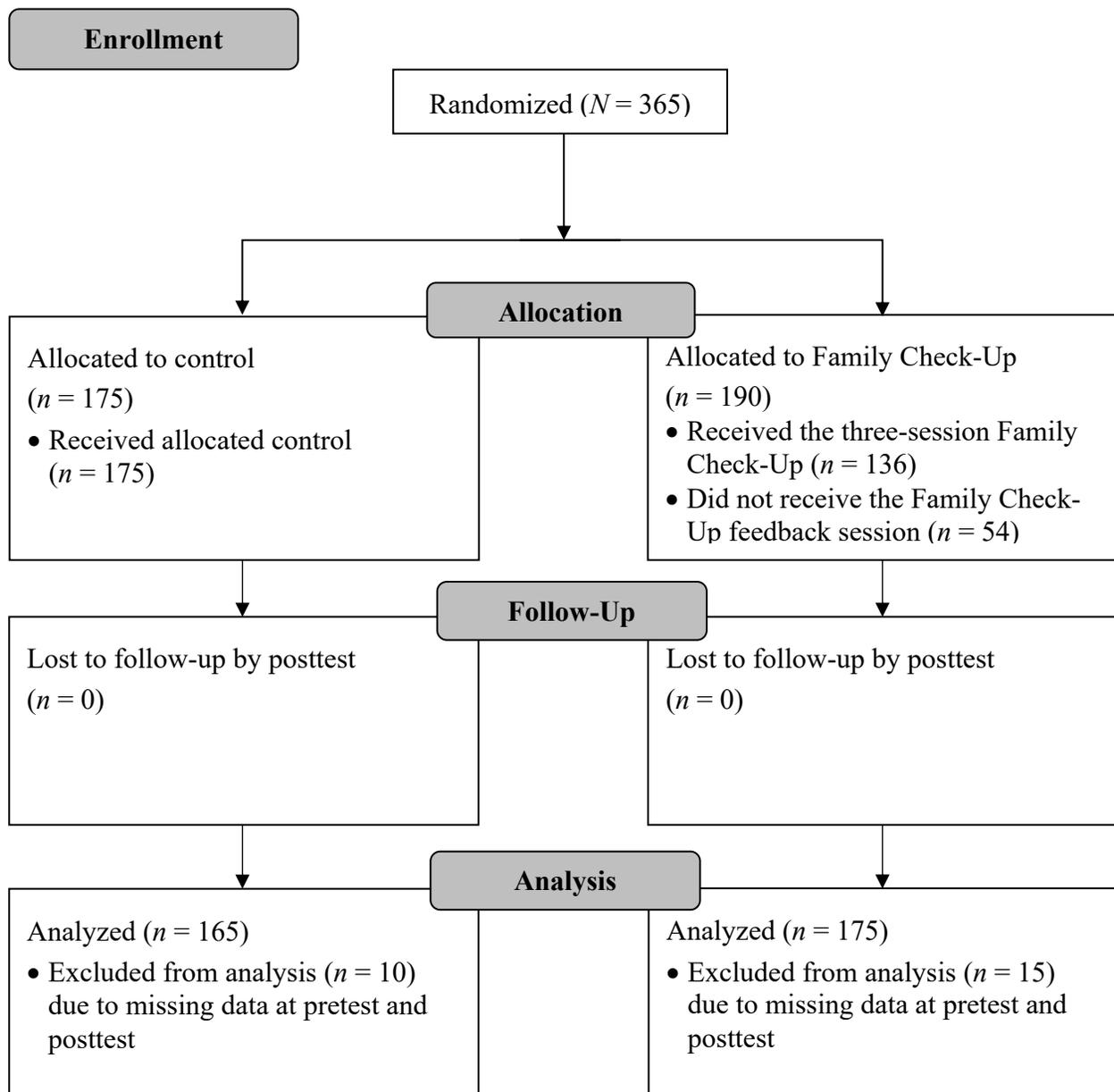


Figure 1. Participant enrollment.

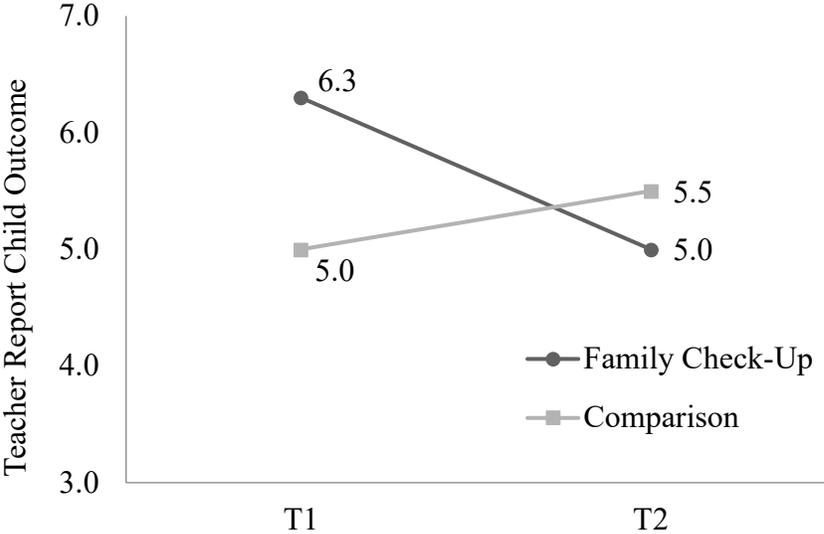


Figure 2. Model-based estimates of pretest and posttest teacher report of children’s emotional and behavior problems.